Injury Burden Report: Opportunities for Prevention in Montana

2010

Executive Summary

Unintentional Injury in Montana

- Unintentional injury is the leading cause of death among 1-44 year olds in Montana accounting for an average of 224 deaths per year in this age group.
- The rate of unintentional injury death has been steadily increasing since 1994 in Montana.
- Over half of all deaths among 15-24 year olds are attributable to unintentional injury.
- An average of 26 years of potential life are lost for every death due to an unintentional injury.

Motor Vehicle Crashes

- Between 2000 and 2008, an average of 228 people died each year due to motor vehicle crashes in Montana.
- The motor vehicle death rate in Montana was nearly 2 times higher than the national rate in 2006.
- Males have a higher death rate due to motor vehicle crashes than do females.

Seat Belt Use

- Only 56% of high school students report always wearing a seat belt while driving. Less than half report wearing a seat belt when they are a passenger.

Falls

- In 2006, Montana had the fourth highest fatality rate for all ages for unintentional falls in the United States when 99 people died from falling.
- Among deaths due to a fall, one in three is from falling on the same level.

Poisoning

- Montana's rate of unintentional poisoning deaths has been climbing since 2000 and in 2008 was six times higher than it was in 2000
- The most common cause of unintentional poisoning deaths in Montana is accidental poisoning due to narcotics and hallucinogens.

Traumatic Brain Injury (TBI)

- Falls, motor vehicle crashes, and health problems (i.e. stroke) are the most frequently self-reported causes of TBI.

Suicide

- Suicides account for nearly a quarter of all injury deaths in Montana with an average of 184 suicide related deaths occurring each year.
- The suicide rate in Montana has been about 2 times higher than the rate in the United States since 2000.

Sexual Violence

- People with lower annual incomes are significantly more likely to be a victim of sexual assault than people of higher annual incomes.

Table of Contents

Introduction

The purpose of this report is to provide an overview of the burden of injury in Montana and includes information on selected unintentional injuries, suicide, and sexual violence. The report describes the characteristics of each injury type including demographic groups affected, number of cases reported, and disparities among race, sex, or age groups. The information is intended to help programs guide prevention and intervention activities.

The report is organized by topics related to injury. First, the general demographics of Montana are presented. The second section displays information on all deaths related to all injuries and unintentional injuries in Montana. Next, several pages are dedicated to each major cause of unintentional injury among Montanans. There is also a page displaying data for several other causes of injury that have a smaller, but important burden in Montana. The final pages of the unintentional injury section display geographic data for major causes of unintentional injury by health planning region and county. Finally, there is a section on intentional injury. Each injury specific section displays a variety of data related to the topic. At the end of the document there is a glossary and a description of the methods used to prepare this report.

The Montana Injury Prevention Program realizes that there are many contributing causes to injury including alcohol and substance use, demographic factors like age and occupation, as well as attitudes and beliefs. While the scope of all of these topics can not be covered in this report, we will attempt to take a more in depth look at some of these topics in future surveillance reports.

This report was prepared by the Montana Department of Public Health and Human Services Injury Prevention Program in collaboration with the Montana Behavior Risk Factor Surveillance Survey Office, the Hospital Discharge Data Program, and the Office Vital Statistics. For more information or questions and comments please contact:

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General

Figure 1. Population of Montana counties, 2009

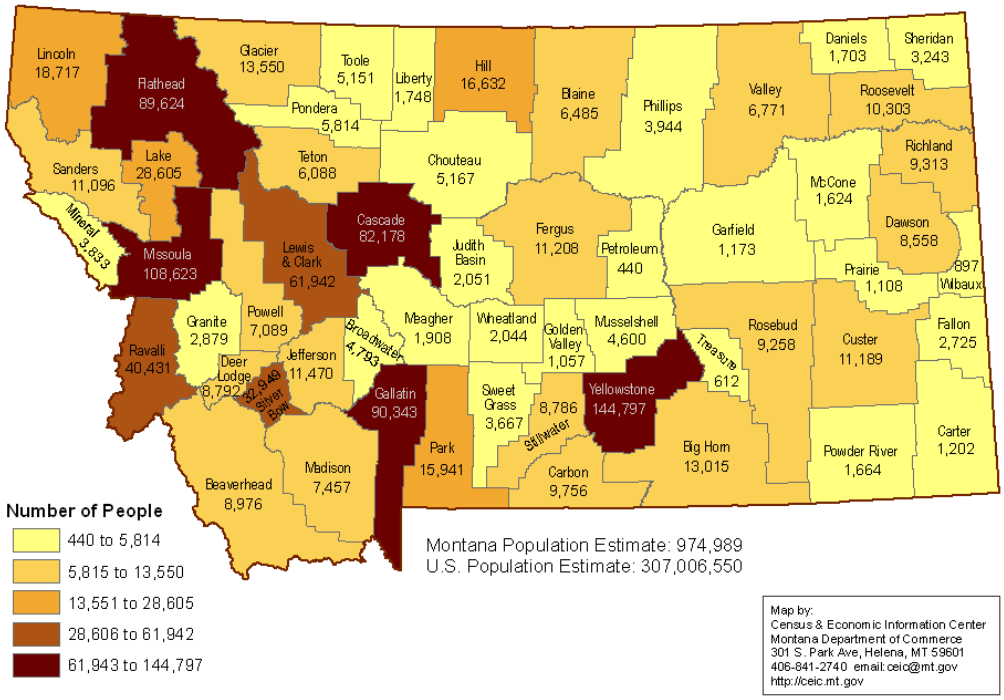
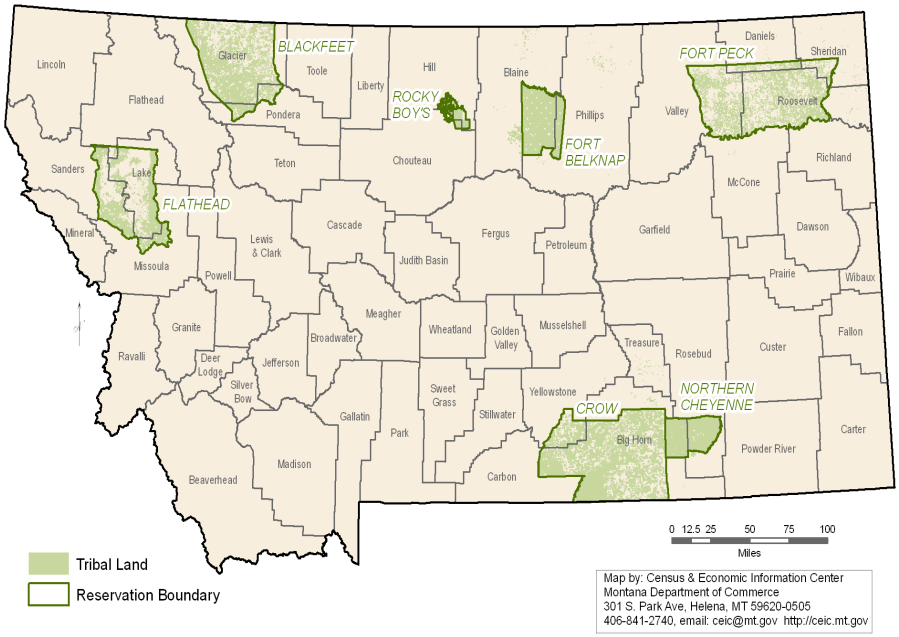


Figure 2 Montana American Indian reservations



- **In 2009, the estimated population of Montana was 974,989[1] (Figure 1). The population in the 56 counties ranges from less than 500 in sparsely populated Petroleum County to over 140,000 in Yellowstone County.**
- **By density, 45 counties are classified as frontier, or having 6 or fewer people per square mile, and 10 counties having 6-50 people per square mile, classifying them as rural.[1] There are 3 metropolitan statistical areas in the state: Billings, Great Falls, and Missoula.**
- **Montana contains seven American Indian reservations (Figure 2).**

General

Table 1. Age and sex of the general population, 2006-2008, US & Montana

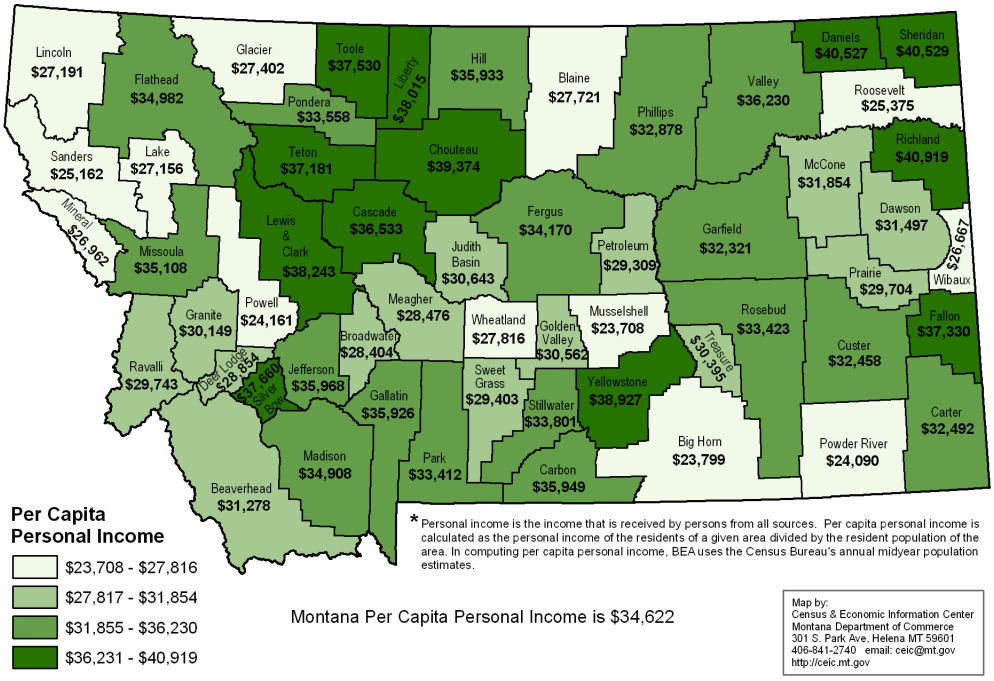
Age in Years	*MT (%)*	*US (%)*
Under 5	6.3	6.9
5-14	12.4	13.4
15-24	14.4	14.1
25-44	24.5	27.6
45-64	28.5	25.4
Over 65	13.9	12.6
Sex	*MT (%)*	*US (%)*
Male	49.9	49.3
Female	50.1	50.7

Table 2. Race of general population, 2006-2008, US & Montana

Race/Ethnicity	*MT (%)*	*US (%)*
White, not Hispanic	89.6	74.3
American Indian/Alaska Native	6.1	0.8
Black or African American	0.6	12.3
Asian	0.6	4.4
Native Hawaiian and Other Pacific Islander	0.1	0.1
Some other race	0.7	5.8
Two or more races	2.3	2.2
Hispanic or Latino, any race	2.8	15.1

The Census Bureau's American Community Survey produces estimates for selected characteristics of the population. Three year averages suggest that the largest age group (of the age groups shown in Table 1) in the Montana population was 45-64 year olds (Table 1), while the sex of the population was evenly distributed between males and females (Table 1). Most Montanans report being either White, non-Hispanic or American Indian/Alaska Native. There are fewer persons of other races in Montana compared to the United States (Table 2). Figure 3 illustrates the personal income of people in Montana in 2008 by county (Figure 3).

Figure 3. Montana per capita income by county, 2008

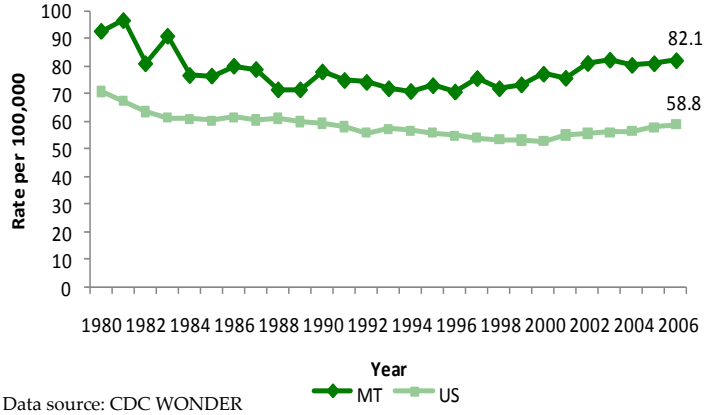


Injury

Overview:

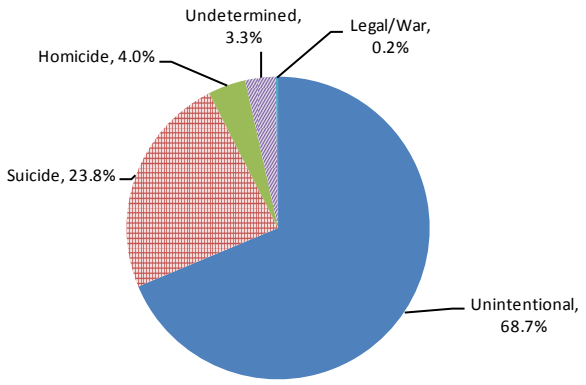
Injury affects people of all ages, races, and sex and has been a leading cause of morbidity and mortality throughout history. Over the last several years of available data, Montana had one of the highest rates of injury death in the nation.[2] In 2008, approximately 850 Montanans died from an injury. Death only represents a small number of injuries occurring each year. There are also many hospitalizations, emergency department and physician visits resulting from injury. For some, an injury is a temporary inconvenience while for others it leads to disability, chronic pain, significant changes in lifestyle, and death. The financial and quality of life costs due to injuries could be reduced in Montana through effective prevention efforts.

Figure 4. Age-adjusted all injury death rate, 1980-2006, US & Montana



Data source: CDC WONDER

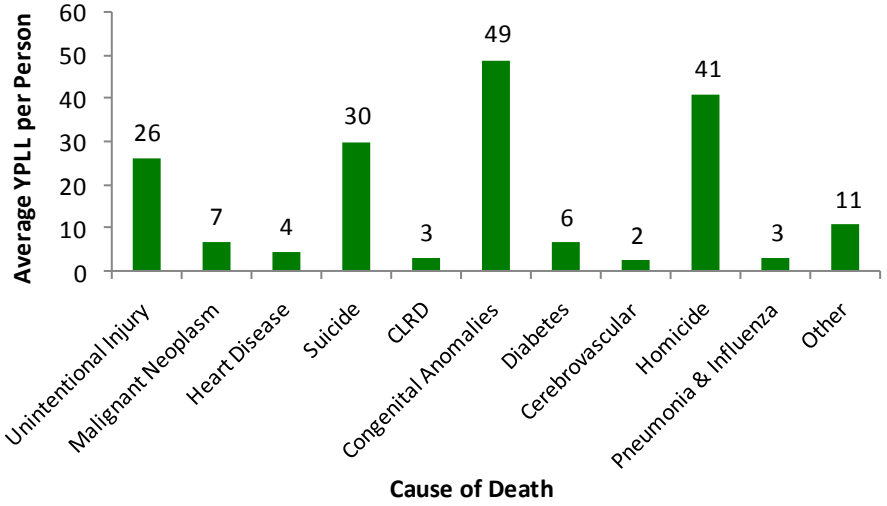
Figure 5. Intent of death related injuries, 2000-2008, Montana



- The injury death rate in Montana has been consistently higher than the US since 1980. (Figure 4).
- About 70% of injury related deaths are unintentional. Over a quarter are intentional (suicide and homicide) (Figure 5).
- An average of 26 years of potential life before reaching 65 years old are lost per unintentional injury death (Figure 6, See glossary for years of potential life lost (YPLL) definition).
- The average YPLL per suicide and homicide (intentional injury) are third and fourth highest (Figure 6).

An average of 530 deaths due to unintentional injury occurred each year between 2000 and 2008 in Montana

Figure 6. Average number of years of potential life lost before age 65 by cause of death, 2000-2008, Montana



Unintentional Injury

Healthy People 2010 Target

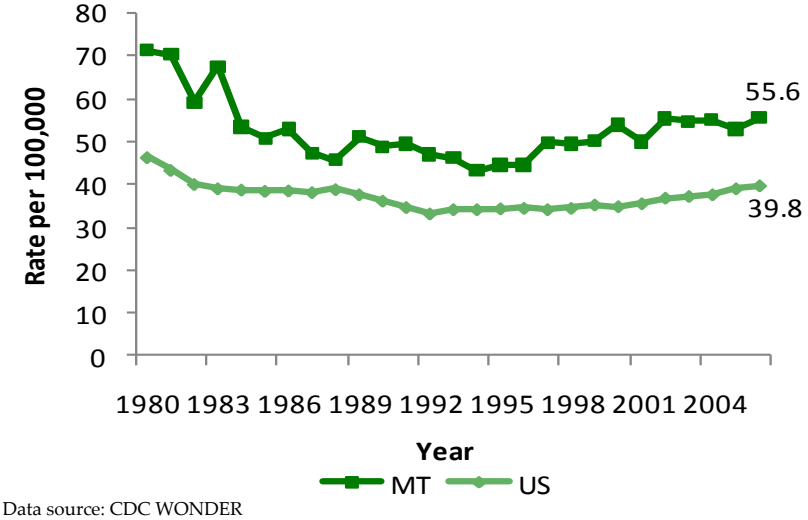
- **Reduce deaths caused by unintentional injuries to 17.5 deaths/100,000 population**

  MT: 58.7 deaths/100,000 population (OVS, 2008)

Overview:

Unintentional injury is categorized as an injury that was not caused on purpose with no intent to harm. Injuries can be caused by environmental exposure, objects (e.g. car, knife, etc), animals, electricity, chemicals, or lack of air. While sometimes referred to as 'accident' that term is not appropriate as injuries are often predictable (not random) and therefore preventable. Of deaths due to injury in Montana, the majority are unintentional and are related to motor vehicle crashes, falls and poisonings. The Montana Injury Prevention Program has chosen to focus on these priority areas.

Figure 7. Age-adjusted unintentional injury death rates, 1980-2006, US & Montana



Data source: CDC WONDER

Table 3. Percent of all deaths attributable to unintentional injury by age group, sex, and race, 2000-2008, Montana

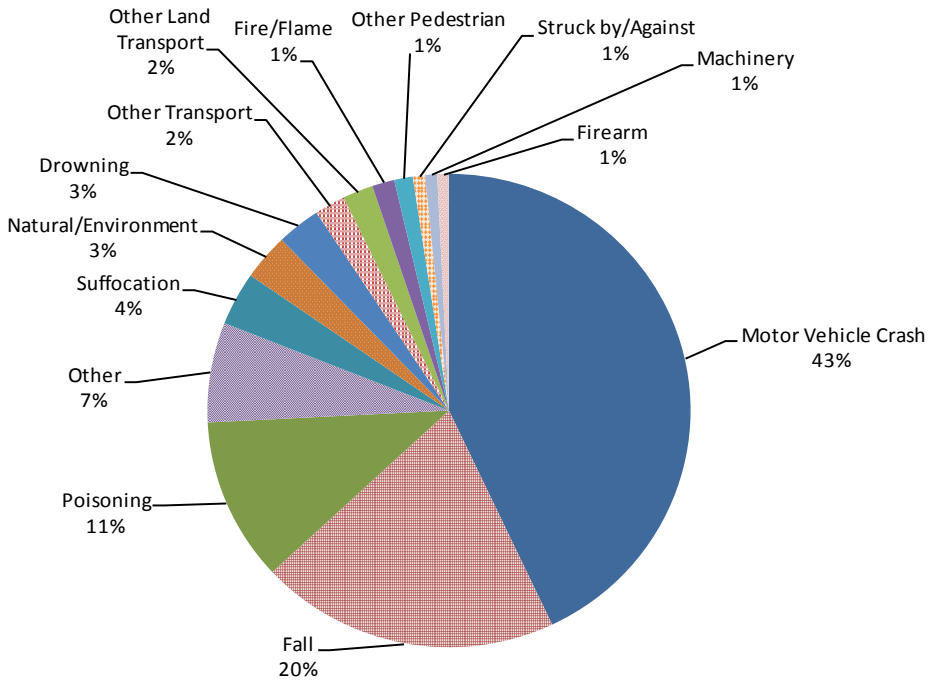
Age Group	*Percent*
0	4
1-4	37
5-14	46
15-24	58
25-34	43
35-44	27
45-54	13
55-64	6
65-74	3
75-84	3
85+	3

Sex	*Percent*
Male	8
Female	5
Race	
American Indian	15
Other	13
White	6
Total	6

- **The rate of unintentional injury has been steadily increasing in Montana since 1994 (Figure 7).**
- **In 2006, the unintentional injury death rate was 40% higher than the national unintentional injury death rate (Figure 7).**
- **About half of all deaths among people aged 5-34 are attributable to unintentional injuries (Table 3).**
- **One out of every twelve males dies from an unintentional injury. This is disproportionately higher than females (Table 3)**
- **One out of every 7 American Indians dies from an unintentional injury. This is twice as frequent as a person of White race (Table 3).**
- **Over 40% of all unintentional injury deaths are due to motor vehicle crashes. One in five are due to falls (Figure 8).**

Unintentional Injury

Figure 8. Percent of unintentional deaths by type, 2000-2008, Montana



Two-thirds of all unintentional injury deaths are among men

Data Source: OVS, 2000-2008

Montana Injury Prevention Program

The Montana Injury Prevention Program (MIPP) has identified three areas as a priority for preventing unintentional injuries: motor vehicle crashes, falls, and poisoning. These causes make up three-quarters of the unintentional injury deaths in the state. Below is a brief description of some of the activities the program supports to address these priority areas.

Seat Belt Use

The MIPP works collaboratively with several groups whose mission is to increase seat belt use in Montana. These groups conduct a variety of activities including increasing local awareness of seat belt use by making toolkits available for interested parties wishing to talk about seat belt use in their community and engaging youth in seat belt awareness.

SBIRT

SBIRT or Screening, Brief Intervention, and Referral to Treatment for alcohol has been implemented in 13 emergency departments in Montana. This program addresses the involvement of alcohol and injuries and provides a quick intervention through motivational interviewing while the injured person is still in the emergency department.

Fall Prevention

Three sites were funded in 2010 for two years to conduct the fall prevention intervention called Stepping On. The program is an evidence based intervention shown to prevent falls among seniors by teaching about strength and balance exercises, home hazard reviews, and encouraging participants to have conversations with their health care providers on vision, nutrition, medications, and assistive devices.

Poisoning

The MIPP supports the Rocky Mountain Poison Center in providing hotline services to Montana residents on potential poisonings and mediation identification. The MIPP also works with the Department of Justice's 'Medication Take Back Program' which works with pharmacies across the state to accept back any unused and/or expired medication (prescription or over the counter) in order to prevent unintentional poisonings.

Motor Vehicle Crashes

Healthy People 2010 Target

- **Reduce nonfatal motor vehicle injuries to 933 nonfatal injuries/100,000 population**
  MT: Unable to calculate
- **Reduce deaths caused by motor vehicle crashes to 9.2 deaths/100,000 population**
  MT: 21.4 deaths/100,000 population (OVS, 2008)

Overview:

A motor vehicle crash refers to involvement in a single car rollover event or a vehicle colliding with another object including other vehicles, pedestrians, bicyclist, animals, road debris, and other structures or . A variety of factors lead to motor vehicle crashes including driver experience, road conditions, alcohol or drug use, distractions, and underlying health conditions, like vision. Seatbelts and child safety seats have been shown to be highly effective in preventing deaths and injuries in motor vehicle crashes.[3] Promoting helmet use for motorcyclists and bicyclists also prevents injuries and deaths.

Figure 9. Age-adjusted death rates due to motor vehicle crashes, 2000-2008, US & Montana

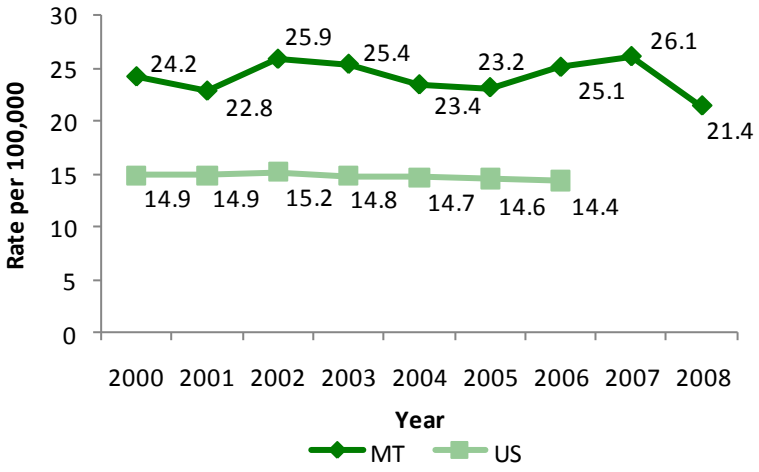
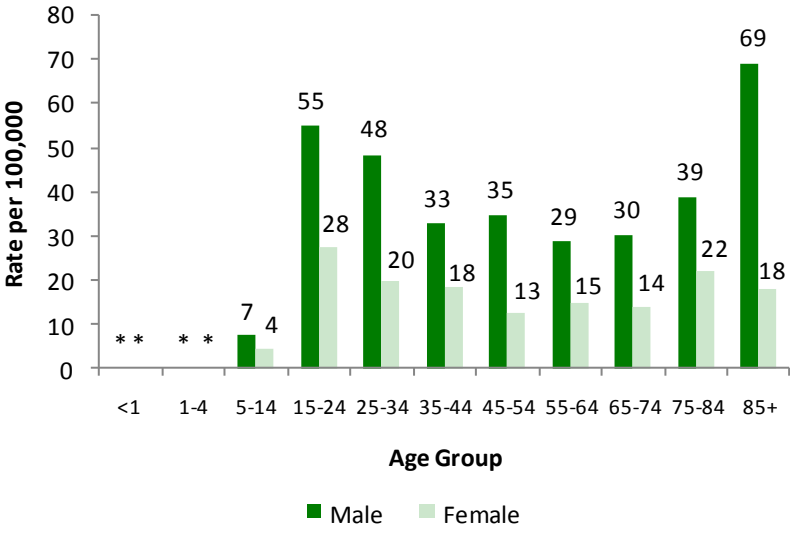


Figure 10. Death rates due to motor vehicle crashes by sex and age group, 2000-2008, Montana

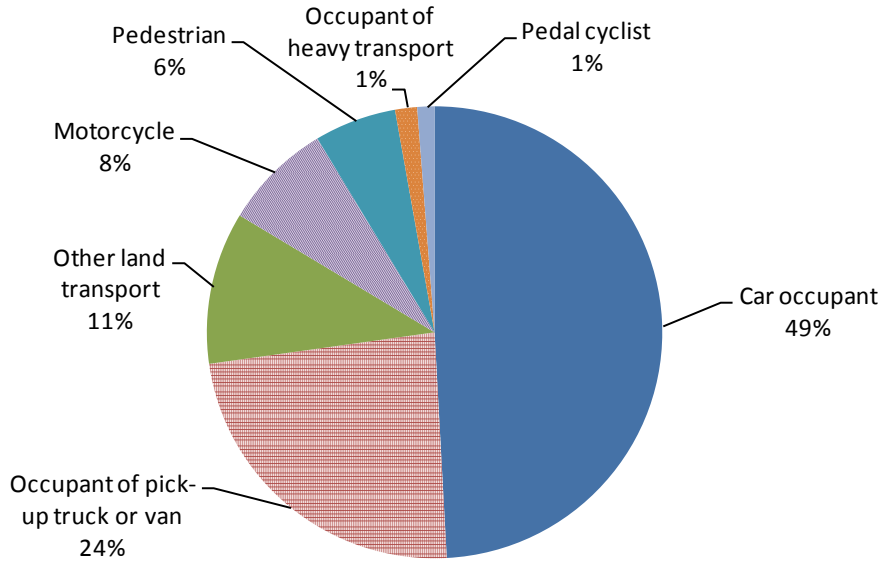


* Too few deaths to calculate stable rate

- **Since 2000, the rate of fatal motor vehicle crashes (MVC) in Montana has remained stable and consistently higher than the US rate (Figure 9).**
- **An average of 228 people died each year in motor vehicle crashes in Montana between 2000 and 2008 (OVS, 2000-2008, Data not shown).**
- **Males have a higher death rate due to MVC than do females for all age groups (Figure 10).**
- **The majority of fatal MVC involve car or truck occupants. Eight percent are among motorcyclists (Figure 11).**
- **The highest rates of fatal and nonfatal trauma injuries occur among 15-24 year olds (Figure 12).**
- **The rate of reported trauma injuries due to MVC is 2.5 times higher among American Indians than that for Whites (Table 4).**
- **About 5% of reported trauma injuries due to a motor vehicle crash are fatal. (Table 4).**

Motor Vehicle Crashes

Figure 11. Deaths due to motor vehicle crash by type, 2000-2008, Montana



In 2008, nearly 1 in 5 injuries occurring in a MVC were alcohol related

Data source: MT Dept of Transportation

Figure 12. Rate of reported trauma due to motor vehicle crashes by age group, 2006-2009, State Trauma Registry, Montana

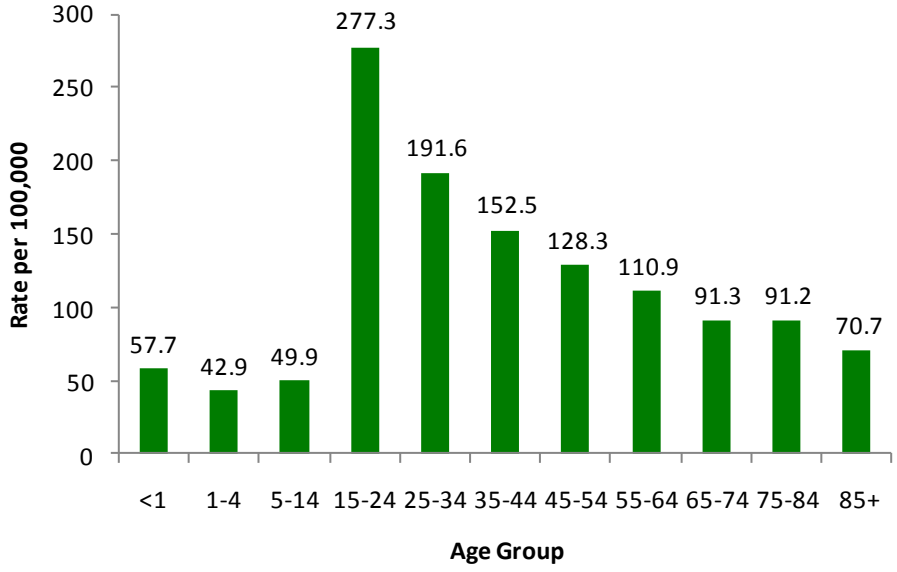


Table 4. Rates of reported trauma due to motor vehicle crashes by selected characteristic, 2006-2009, State Trauma Registry, Montana

	Rate per 100,000
Total	137.7
Sex	
Male	170.1
Female	104.3
Race	
American Indian	257.9
Other	238.7
White	116.7
Discharge Location	*Percent*
Died	4.8
Home	62.1
Rehab	12.6
To higher level of care	18.0
Other/Unknown	2.5

Seat Belt Use

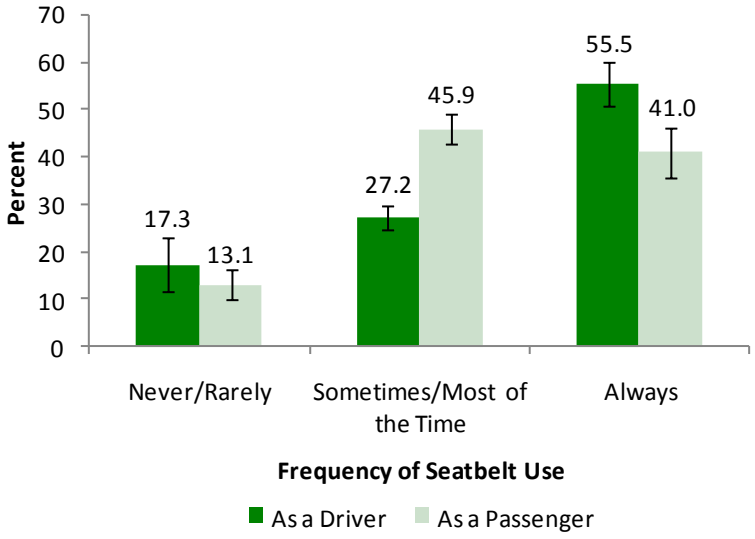
Healthy People 2010 Target

- Increase use of safety belts to 92% of total population using safety belts
  MT: 79.2% (MT Dept of Trans, 2009)
- Increase use of child restraints to 100% of MV occupants aged 4 years and under using child restraint safety seat
  MT: Unable to calculate

Overview:

Seat belts have been shown to be the single most effective means of reducing fatal and nonfatal injuries in a MVC. By preventing drivers and passengers from being ejected from the vehicle or jostled inside the vehicle, certain types and severity of injury can be reduced or avoided. Seat belt use has been shown to be higher in states with a primary seat belt law[4]*. These laws also reduce disparities in belt use. By promoting seat belt use, Montana could see a reduction in motor vehicle related deaths and hospitalizations.

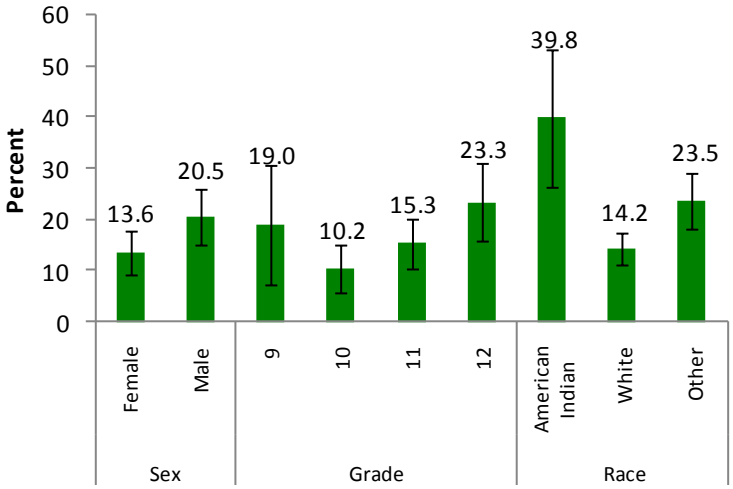
Figure 13. Self-reported seat belt use among Montana high school students, YRBS, 2009



- 71% of Montana adults report always wearing their seat belt while driving (BRFSS, 2008, Data not shown).
- Only 56% of Montana teen drivers and 41% of Montana teen passengers report always wearing a seat belt (Figure 13).
- For more information on teens and seat belt use, see the full report at http://www.dphhs.mt.gov/ems/prevention/prevention_menu.html

- About one in five male high school students report never or rarely wearing a seat belt while driving (Figure 14).
- Nearly a quarter of 12th graders never or rarely wear a seat belt while driving (Figure 14).
- 40% of American Indian high school students report never or rarely wearing a seat belt while driving (Figure 14).

Figure 14. Percent of high school students who never or rarely wear a seat belt while driving by sex, grade, and race, YRBS, 2009, Montana



I=95% Confidence Interval
*Permits law enforcement to ticket drivers solely for not wearing a seatbelt.

Specific Transport Crashes

Overview:

Not all transport crashes occur on public roadways. Other forms of transportation including watercraft, all-terrain vehicles and snowmobiles, aircraft, animals, and motorcycles contribute to unintentional injury morbidity and mortality in Montana. Avoidance of alcohol when operating forms of transport, following safety laws, and the use of personal protective equipment, including helmets and lifejackets could reduce the burden of these injuries in Montana.

Healthy People 2010 Target

- **Increase proportion of motorcyclists using helmets to 79%**
  - **MT: Unable to calculate**

Figure 15. Death rates due to specific transport causes, 2000-2008, Montana

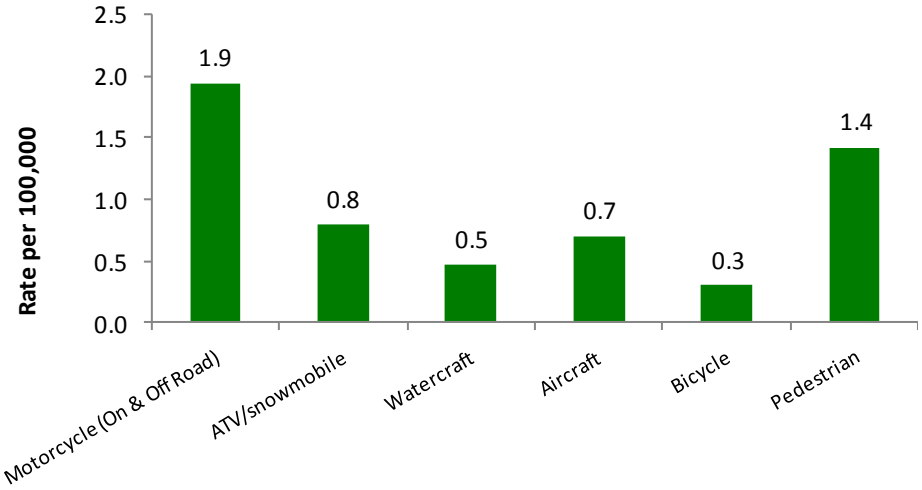
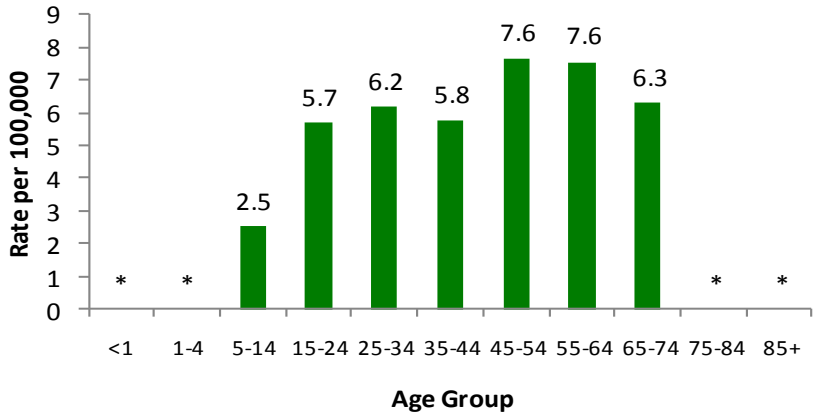


Figure 16. Death rates due to specific transport causes by age group, 2000-2008, Montana**



- **The highest rate of specific transport deaths is by motorcycle (Figure 15).**
- **The rate of deaths due to motorcycles, ATV/snowmobiles, watercraft, bicycles, pedestrians, and aircraft is highest among 45-64 year olds (Figure 16).**
- **Over half of all pedal cycle, watercraft, ridden animal, motorcycle and ATV/snowmobile trauma injuries were not using any protective equipment (State Trauma Registry, 2006-2009, Data not shown).**

* Too few deaths to calculate stable rate
** Includes motorcycles, ATV/snowmobiles, watercraft, aircraft, bicycles, and pedestrian related deaths

Specific Transport Crashes

- The rate of traumas due to motorcycles, ATV/snowmobiles, animal transport, bicycles, and pedestrians is higher among men than women (Table 5).
- The rate of animal related trauma injuries is highest among people 45-64 years old (Table 5).
- The highest rates for trauma due to other transport types is due to motorcycles followed by ATV/snowmobile related traumas (Table 5).
- About 20% of people involved in a motorcycle, ATV/snowmobile, animal related, or bicycle related trauma had to be transferred to a higher level of care (Table 5).
- Nearly 9% people sustaining a trauma as a pedestrian died (Table 5).

Table 5. Rate and percent of reported traumas due to specific transport causes by selected characteristic, 2006-2009, State Trauma Registry, Montana

	Motorcycle (On & Off Road)	*ATV/Snowmobile*	*Animal* Related*	*Bicycle*	*Pedestrian*
			Rate per 100,000		
Total	26.1	18.7	16.2	6.0	8.5
Sex			*Rate per 100,000*		
Male	42.8	30.0	18.4	9.5	10.7
Female	9.4	7.3	13.7	2.5	6.3
Age Group			*Rate per 100,000*		
0-24	17.2	20.2	4.1	7.8	11.4
25-44	34.5	21.9	15.0	6.1	7.3
45-64	38.3	16.9	19.7	5.7	6.9
65 and older	8.1	13.2	10.3	DNS	7.0
Race			*Rate per 100,000*		
American Indian	5.3	11.0	19.8	DNS	21.4
Other	23.6	11.0	14.1	DNS	DNS
White	26.0	18.4	14.8	5.5	6.9
Discharge Location			*Percent*		
Died	5.8	1.9	1.3	4.3	8.9
Home	63.0	67.5	69.7	67.4	55.4
Rehab	10.3	7.1	7.9	7.0	18.0
To higher level of care	18.5	19.5	18.7	19.6	16.8
Other/unknown	2.4	3.9	2.4	1.7	0.9

***Ridden animal or vehicle pulled by animal**
DNS=Data not sufficient for calculation

Falls

Overview:

Unintentional falls result in a variety of injuries, causing significant health burdens. Serious fall injuries, especially among older individuals may lead to a loss of independence or a fear of falling that causes them to limit their activities, reducing their mobility and strength.[5] Fall related injuries result in significant health care costs that can be avoided by encouraging regular exercise for older persons, emphasizing the importance of checking the home for potential fall hazards, and encouraging regular vision exams and review of medication with a healthcare provider.

Healthy People 2010 Target

- **Reduce deaths from falls to 3.0 deaths/100,000 population**
  - **MT: 11.7deaths/100,000 population (OVS, 2008)**
- **Reduce hip fractures among older adults (65+)**
  - Females: 416 hip fractures/100,000 population
  - Males: 474 hip fractures/100,000 population
  - **MT females: 785 hip fractures/100,000 population (HDDS, 2008)**
  - **MT males: 357 hip fractures/100,000 population (HDDS, 2008)**

Figure 17. Age-adjusted death rates due to unintentional falls, 2000-2008, US & Montana

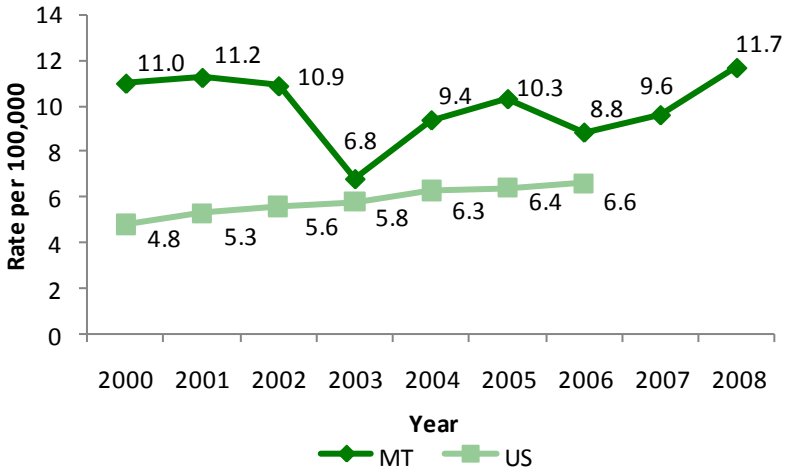
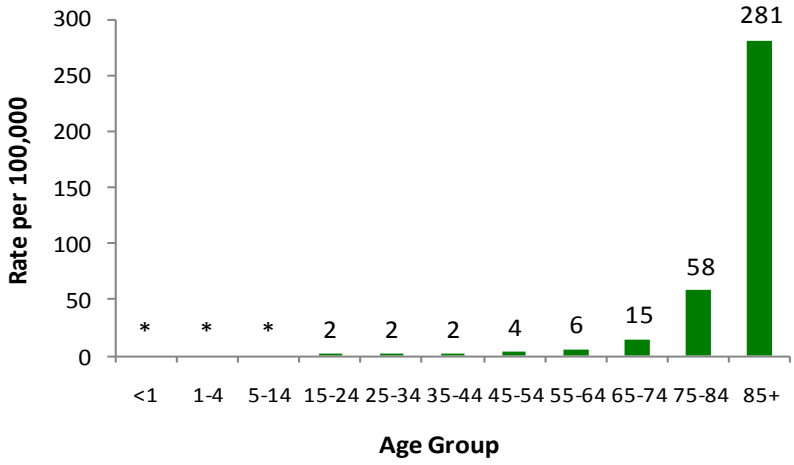


Figure 18. Death rates due to unintentional falls by age group, 2000-2008, Montana

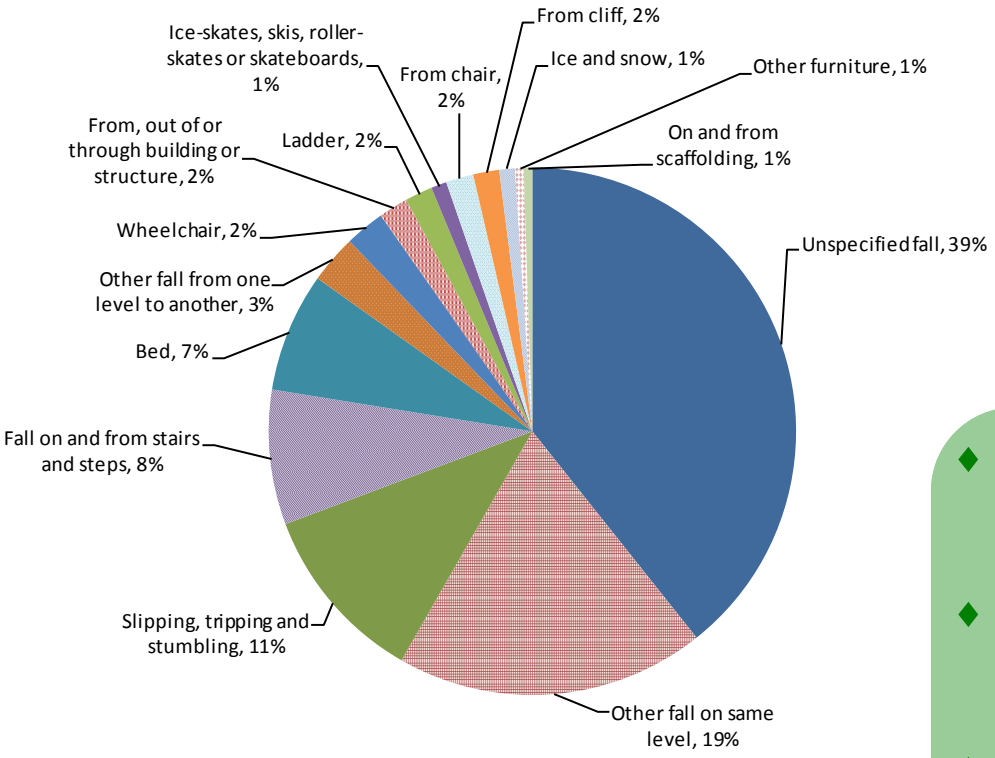


* Too few deaths to calculate stable rate

- **In 2006, Montana had the fourth highest fall fatality rate for all ages in the United States[6] (Data not shown). That year there were 99 deaths due to falls.**
- **The rate of death due to falls has increased since 2003 (Figure 17).**
- **The death rate due to falls is highest among persons 65 and older (Figure 18).**
- **Nearly half of fall related deaths occur in the home. Twelve percent occur in a nursing home and 10% occur at another institution (OVS, 2000-2008, Data not shown).**

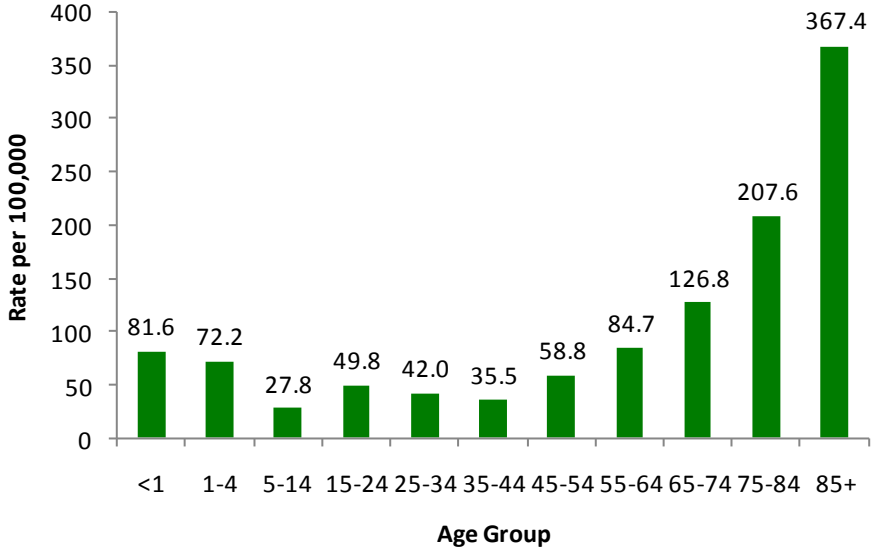
Falls

Figure 19. Reason for fall injury death, 2000-2008, Montana



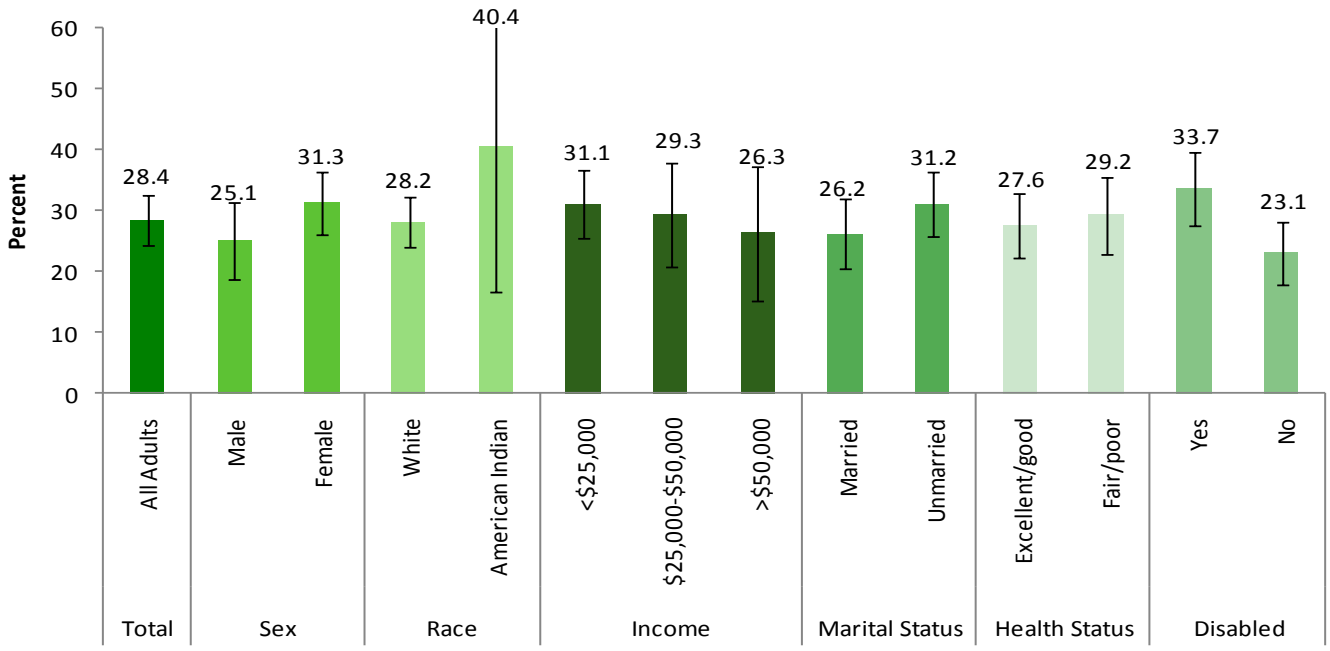
- Among deaths due to a fall, one in three is from falling on the same level (Figure 19).
- The rate of reported trauma due to falls is highest among infants and persons over 55 (Figure 20).
- Males have fall related traumas at a rate nearly twice as high as females (Table 6).
- The highest rate of fall related trauma is among Whites (Table 6).
- About half of people with fall related trauma are discharged to their home. One in five are discharged to rehabilitation or higher levels of care (Table 6).

Figure 20. Rate of reported trauma due to falling by age group, 2006-2009, State Trauma Registry, Montana



Falls

Figure 21. Percent of adults aged 65 years and older who fell and were injured in the last 3 months by selected characteristics, BRFSS, 2006 & 2008, Montana



I=95% Confidence Interval

Table 6. Reported trauma due to falling by selected characteristics, 2006-2009, State Trauma Registry Montana

	Rate per 100,000
Total*	71.6
Sex	
Male	91.5
Female	51.5
Race	
American Indian	61.0
Other	62.8
White	67.1
Discharge Location	*Percent*
Died	4.8
Home	52.3
Rehab	22.0
To higher level of care	17.9
Other/Unknown	3.1

*Due to large proportion of unknown race, the total rate is higher than all individual races

- **Combined data from 2006 and 2008 suggest that of adults 65 years and older, over 28% report being injured from a fall in the last 3 months (Figure 21).**
- **Females and American Indians had a higher frequency of fall-related injury than males and Whites, respectively, but the difference is not statistically significant (Figure 21).**
- **There were no significant differences in frequency of fall-related injuries among income, marital status, health status, or disability groups (Figure 21)**
- **In 2006, 31.3% of adults aged 65 or older in the US reported fall-related injuries in the preceding 3 months. This was slightly higher than the overall Montana percent in 2006.[7]**

Poisoning

Healthy People 2010 Target

- **Reduce nonfatal poisonings to 292 nonfatal poisonings per 100,000 population**
  MT: Unable to calculate
- **Reduce deaths caused by poisonings (intentional & unintentional) to 1.5 deaths per 100,000 population**
  MT: 16.7 deaths per 100,000 population (OVS, 2008)

Overview:

A poison refers to 'any substance that is harmful to your body when ingested, inhaled, injected, or absorbed through the skin'.[7] Unintentional poisoning includes the use of drugs or chemicals for recreational purposes or non-intentional overdoses. Most poisoning deaths in the US are attributable to prescription drug abuse or illegal drug use.[8] Morbidity and mortality from unintentional poisoning could be reduced by promoting safe storage and use of prescription drugs, safe use of household chemicals, and increasing the of awareness of carbon monoxide poisoning.

Figure 22. Age-adjusted death rates due to unintentional poisoning, 2000-2008, US & Montana

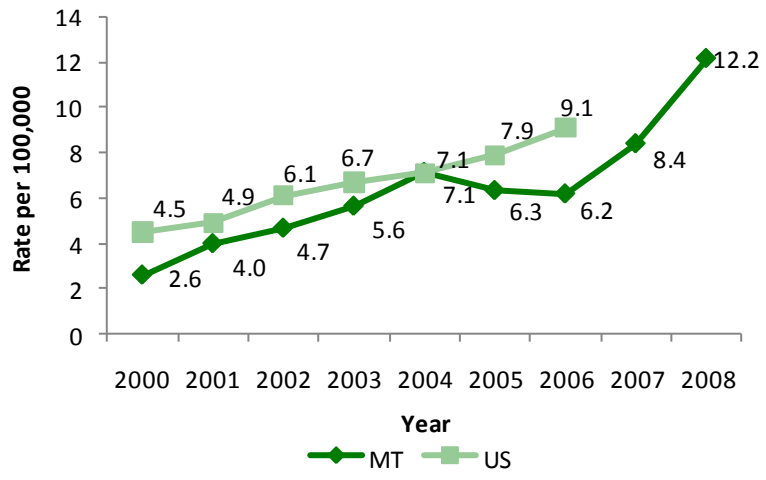
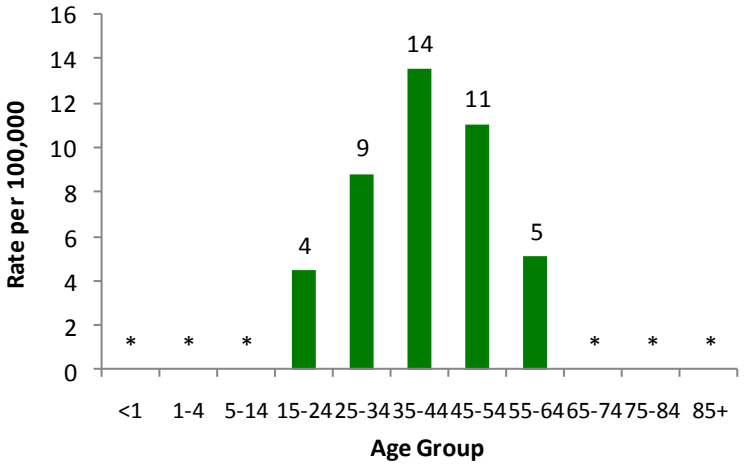


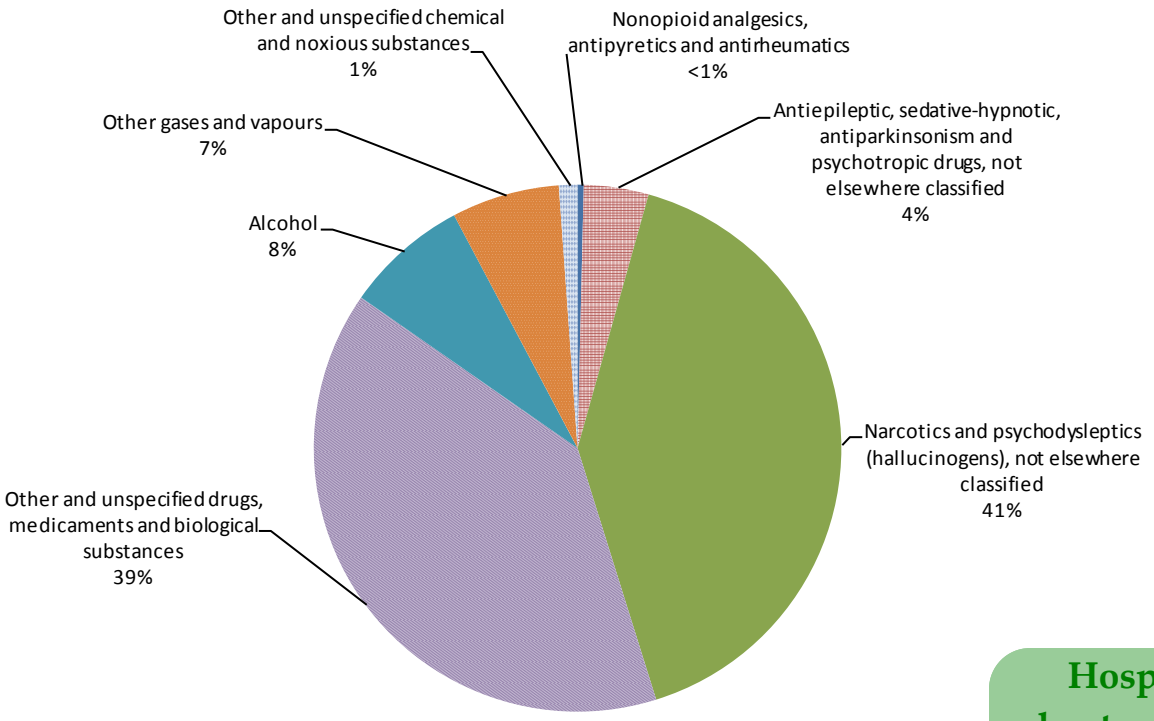
Figure 23. Death rates due to unintentional poisoning, by age group, 2000-2008, Montana



* Too few deaths to calculate stable rate

- **The rate of unintentional poisoning deaths in Montana has been climbing since 2000 and in 2008 was six times higher than 2000 at 12.2 deaths per 100,000 (Figure 22). In 2008, 114 people died from unintentional poisoning.**
- **In 2006, the national rate for unintentional poisoning deaths was 9.1 deaths per 100,000 while in Montana it was 6.2 (Figure 22).**
- **The rate of unintentional poisoning deaths is highest among people 35-44 years old. (Figure 23).**
- **The most common cause of unintentional poisoning deaths in Montana is accidental poisoning due to narcotics and psychodysleptics (hallucinogens) (Figure 24).**
- **Females had higher rates of hospitalization for all intents of poisoning than males (Figure 25).**
- **Hospitalization rates for all intents of poisoning were highest among 35-44 year olds (Figure 25).**
- **American Indians accounted for 14% of all unintentional poisoning deaths in Montana (Table 7).**

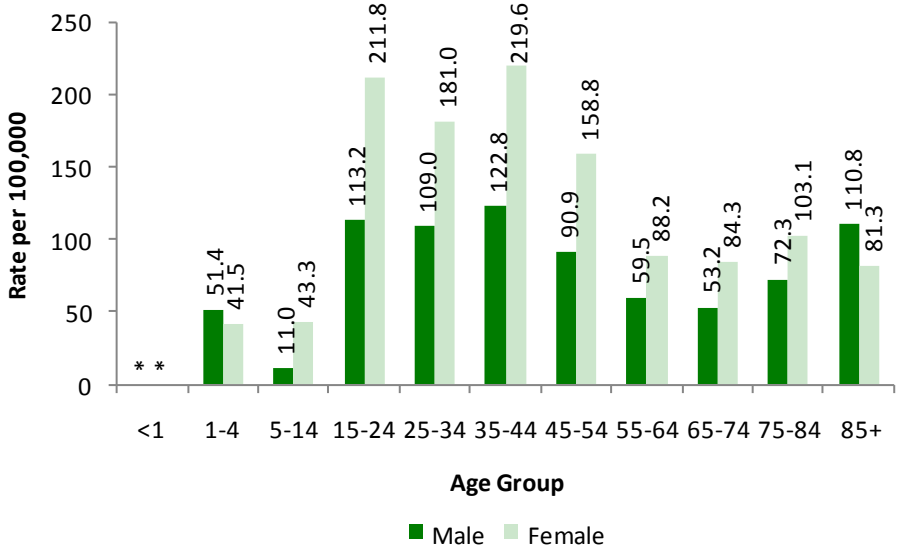
Figure 24. Reason for Unintentional Poisoning Death, 2000-2008, Montana



Hospitalizations due to poisoning cost $8.6 million in Montana in 2008

Data Source: HDDS, 2008

Figure 25. Hospitalization rates due to unintentional and intentional poisoning by age group and sex, 2004-2008, Montana



* Too few hospitalizations to calculate stable rate

Table 7. Percent of deaths due to unintentional poisoning, by race, 2004-2008, Montana

Race	*Percent '*
American Indian	14
Other	<1
White	85

Traumatic Brain Injury

Healthy People 2010 Target

- **Reduce hospitalizations for nonfatal head injuries to 45 hospitalizations/100,000 population**
  - **MT: 112.2 hospitalizations/100,000 population (HDDS, 2008)**

Overview:

Traumatic brain injury (TBI) is defined as 'a blow or jolt to the head or a penetrating head injury that disrupts normal function'.[9] There are three categories of TBI: mild, moderate, and severe, all of which can lead to life-long difficulties or disruptions in daily life.

The number of people living with TBIs grows each year, making it one of the largest health concerns in the United States. The impact of TBI could be reduced by promoting seatbelt use in motor vehicles, helmet use for activities like skiing, skateboarding, bull and horse riding, and while riding motorcycles or ATVs, as well as preventing suicide attempts and falls.

Figure 26. TBI death rates by selected characteristics, 2006-2008, Montana

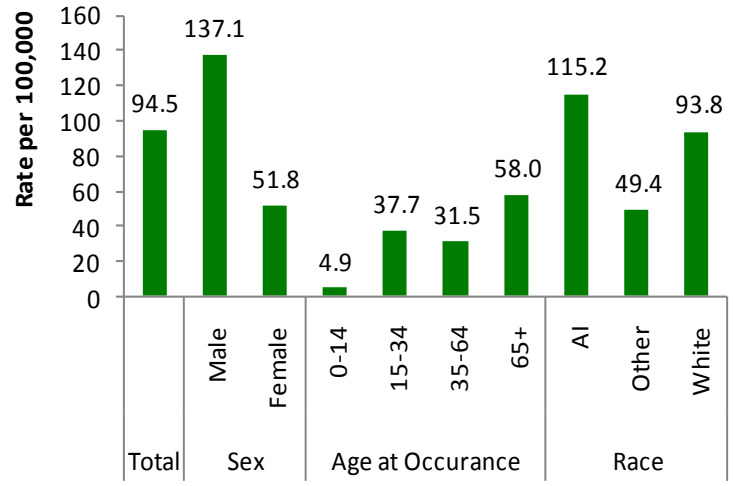
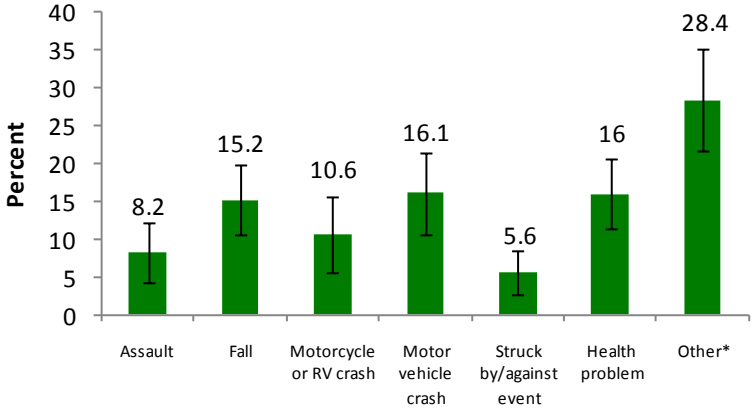


Figure 27. Causes of TBI among adults, BRFSS, 2008, Montana



I=95% Confidence Interval

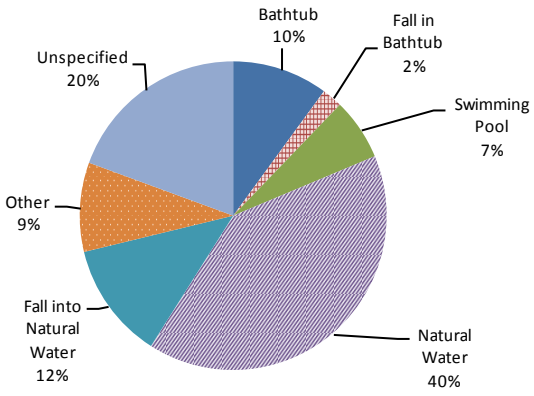
*Other includes pedal cycle accidents, equestrian accidents, sports or recreation related events, lack of oxygen, and other causes or multiple causes.

- **In the US, 1.7 million TBIs are reported each year. Of those, 52,000 result in deaths, 275,000 are hospitalized, and 1.4 million are treated and released from an emergency department (Data not shown).[9]**
- **An average of 1150 people are hospitalized each year due to TBI in Montana. Six percent of those die (HDD, 2006-2008, Data not shown).**
- **Males have a TBI related death rate 2.6 times higher than females in Montana (Figure 26).**
- **Persons 65 years and older have the highest rate of TBI death of all age groups and American Indians have higher death rates than other races (Figure 26).**
- **In 2008, falls, motor vehicle crashes, and health problems were the most frequently self-reported causes of TBI (Figure 27).**
- **Over 5% of Montanan adults report having ever had a TBI (BRFSS, 2006-2008, Data not shown).**
- **About 3% (9,400 homes) of Montana households have 1 or 2 adults that are currently limited by a brain injury (BRFSS 2006-2008, Data not shown).**

Other Preventable Injury Related Topics

Drowning

Figure 28. Cause of death due to drowning, 2000-2008, Montana



- Fifty percent of drowning in Montana between 2000 and 2008 were in natural bodies of water (Figure 28).
- Males and American Indians have higher death rates due to drowning than females and whites, respectively (Table 8).
- The crude drowning death rate in Montana (1.7 deaths per 100,000)was slightly higher than the national drowning death rate of 1.1 deaths per 100,000 in 2006 (Table 8).

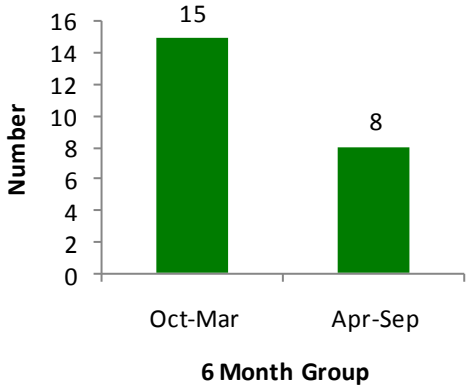
Table 8. Death rates due to drowning by sex, race, and age 2000-2008, Montana

	Rate per 100,000
Total	1.7
Sex	
Male	2.7
Female	0.6
Race	
American Indian	3.9
Other	DNS
White	1.5
Age Group	
0-14	1.7
15-24	2.7
25-44	1.3
45-64	1.2
65+	2.1

DNS=Data not sufficient

Carbon Monoxide Poisoning

Figure 29. Number of unintentional carbon monoxide poisonings by month of occurrence, 2003-2008, Montana



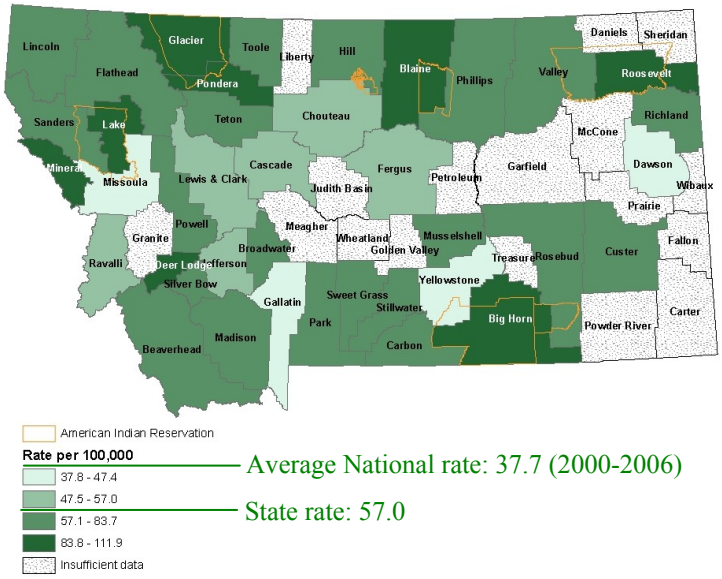
- Twice as many unintentional carbon monoxide (CO) poisonings occurred in winter months versus summer months (Figure 29).
- Nearly three times as many men died from unintentional CO poisoning as women between 2003 and 2008 in Montana (Table 9).
- The death rate for unintentional CO poisoning in Montana was 4.1 deaths/1,000,000 people. This is over 2.5 times higher than the national rate of 1.5 deaths/1,000,000 people for the period 1999-2004.[10]

Table 9. Number of deaths due to unintentional carbon monoxide poisoning by sex, race, and age group, 2003-2008, Montana

	Number
Total	23
Sex	
Male	17
Female	6
Race	
American Indian	<5
Other	<5
White	22
Age Group	
0-44	7
45-64	10
65+	6

Geography

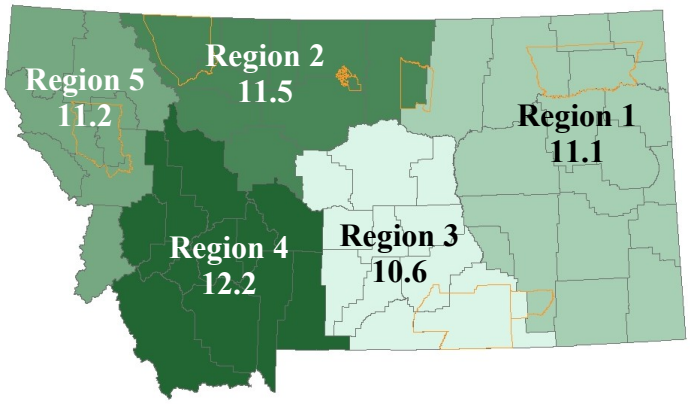
Figure 30. Death rate due to unintentional injury by county, 2000-2008, Montana



Average National rate: 37.7 (2000-2006)

State rate: 57.0

Figure 31. Death rate due to falls by health planning region, 2000-2008, Montana

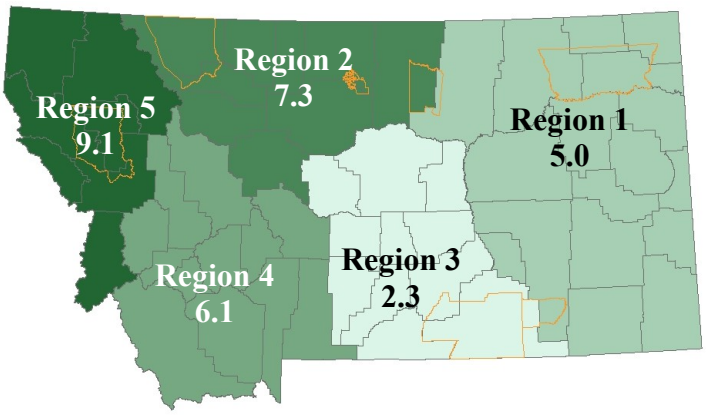


Average National rate: 6.0 (2000-2006)

Average State rate: 11.4

- **Counties with the highest death rates are shown in darker colors (Figures 30-33).**
- **Every county with sufficient data for rate calculation had a higher death rate than the national death rate for unintentional injuries (Figure 30).**
- **Death rates for unintentional falls, poisonings, and motor vehicle crashes are in Figures 31, 32, and 33, respectively. The rate per 100,000 population is listed below the region number.**
- **Specific rates and counts of unintentional deaths by county are listed in Table 12.**

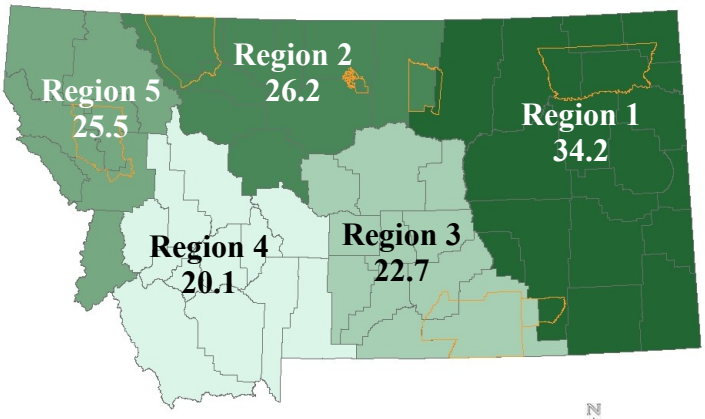
Figure 32. Death rate due to poisoning by health planning region, 2000-2008, Montana



Average National rate: 6.7 (2000-2006)

Average State rate: 6.3

Figure 33. Death rate due to motor vehicle crashes by health planning region, 2000-2008, Montana



Average National rate: 14.9 (2000-2006)

Average State Rate: 24.4

County Data

Table 10. Death rates due to unintentional injury by county, 2000-2008, Montana

County	Number	Rate*
Beaverhead	58	72.4
Big Horn	125	108.8
Blaine	58	96.7
Broadwater	28	69.9
Carbon	54	62.1
Carter	<20	—
Cascade	358	48.9
Chouteau	24	48.7
Custer	66	64.9
Daniels	<20	—
Dawson	36	46.2
Deer Lodge	76	93.6
Fallon	<20	—
Fergus	54	52.6
Flathead	425	58.2
Gallatin	267	37.9
Garfield	<20	—
Glacier	124	103.6
Golden Valley	<20	—
Granite	<20	—
Hill	89	60.4
Jefferson	49	51.4
Judith Basin	<20	—
Lake	243	97.8
Lewis & Clark	253	48.6
Liberty	<20	—
Lincoln	129	76.7
Madison	47	74.0
McCone	<20	—
Meagher	<20	—
Mineral	33	94.8
Missoula	421	46.2
Musselshell	27	67.7
Park	90	63.3
Petroleum	<20	—
Phillips	29	77.4
Pondera	54	98.7
Powder River	<20	—
Powell	39	61.9
Prairie	<20	—
Ravalli	188	54.1
Richland	55	66.4
Roosevelt	91	97.7
Rosebud	59	71.3
Sanders	79	82.5
Sheridan	<20	—
Silver Bow	177	59.3
Stillwater	50	66.1
Sweet Grass	20	60.6
Teton	38	68.2
Toole	29	62.3
Treasure	<20	—
Valley	46	71.2
Wheatland	21	111.9
Wibaux	<20	—
Yellowstone	495	40.7
Total	4771	57.0

* Data insufficient for rate calculation when based on less than 20 events

Intentional Injury

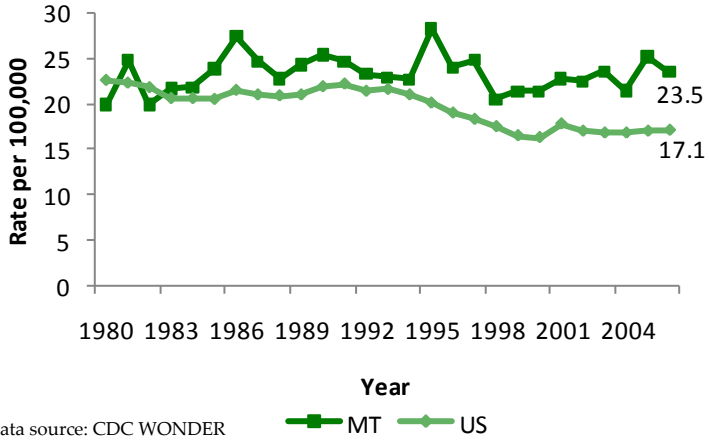
Healthy People 2010 Target

- **Reduce homicides to 3.0 homicides/100,000 population**
  MT: 4.1 homicides/100,000 population (OVS, 2008)
- **Reduce weapon carrying by adolescents on school property to 4.9% of students in grades 9 through 12 carrying weapons on school property during the past 30 days**
  MT: 7.8% (YRBS, 2009)

Overview:

Intentional injury refers to acts of harm directed towards ones self or others. Intentional injuries include suicide, homicide, child abuse, assaults, and bullying. Intentional injury is a significant source of morbidity and mortality in Montana and an average of 215 people die each year due to intentional injuries. Prevention efforts in the state are addressed by a variety of programs including the DPHHS organized Suicide Prevention and Rape Prevention Education Programs.

Figure 34. Age-adjusted intentional injury death rates, US & Montana, 1980-2006, Montana



Data source: CDC WONDER

Figure 35. Homicide deaths by cause, 2000-2008, Montana

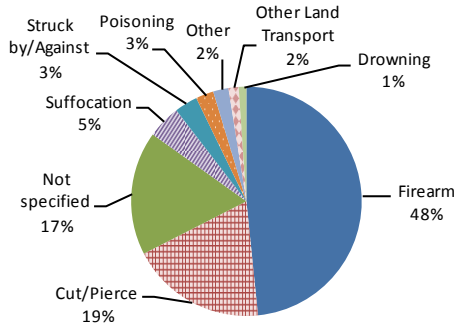
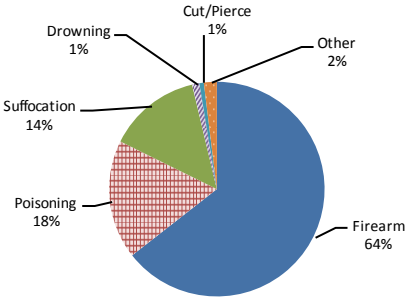


Figure 36. Suicide deaths by cause, 2000-2008, Montana



- The rate of intentional injury deaths in 2006 in Montana is similar to the rate in 1980 (Figure 34).
- The rate of intentional injury deaths has been higher than the national rate since 1984 (Figure 34).
- Nearly half of homicides and nearly two thirds of suicides are caused by firearms (Figures 35, 36).
- In Montana, 86% of intentional injury deaths are due to suicide (OVS, 2000-2008, Data not shown).
- About 25% of all deaths among 15-34 year olds are attributable to intentional injuries (Table 11).
- One out of every 20 deaths among American Indians is from an intentional injury (Table 11).

Table 11. Percent of all deaths attributable to intentional injury by age group, sex, and race, 2000-2008, Montana

	Percent
Total	3
Age Group	
0	1
1-4	9
5-14	14
15-24	24
25-34	26
35-44	16
45-54	7
55-64	3
65-74	1
75-84	1
85+	0
Sex	*Percent*
Male	4
Female	1
Race	
American Indian	5
Other	5
White	2

Suicide

Overview:

Suicide is the eleventh leading cause of death in the US. However, more people survive a suicide attempt than die leading to serious and costly injuries that may last a lifetime.[11] Suicide survivors often have depression and other mental health issues.[11] Suicide awareness increases the chances that someone will recognize the warning signs of suicide and intervene in someone's life who is contemplating suicide. Preventing suicides in Montana is an important public health issue.

Healthy People 2010 Target

- **Reduce the suicide rate to 5.0 suicides per 100,000 population**
  - **MT: 20.6 suicides per 100,000 population (OVS, 2008)**
- **Reduce the rate of suicide attempts by adolescents to a 12-month average of 1 percent**
  - **MT: 2.8% in last 12 months (YRBS, 2009)**

Figure 37. Age-adjusted death rate due to suicide, 2000-2008, US & Montana

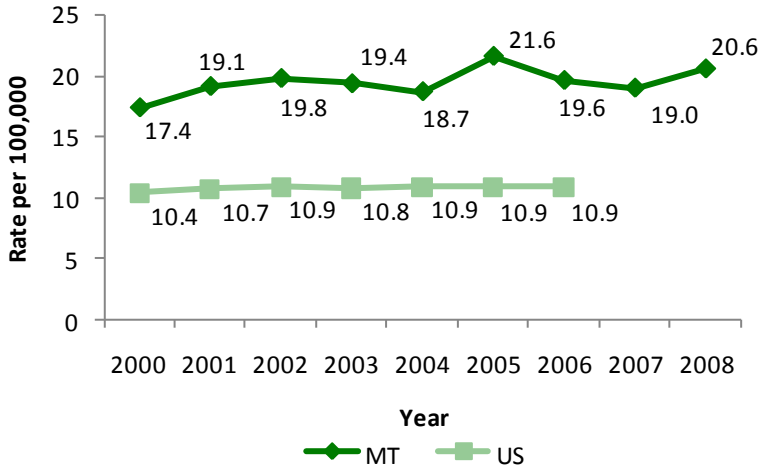
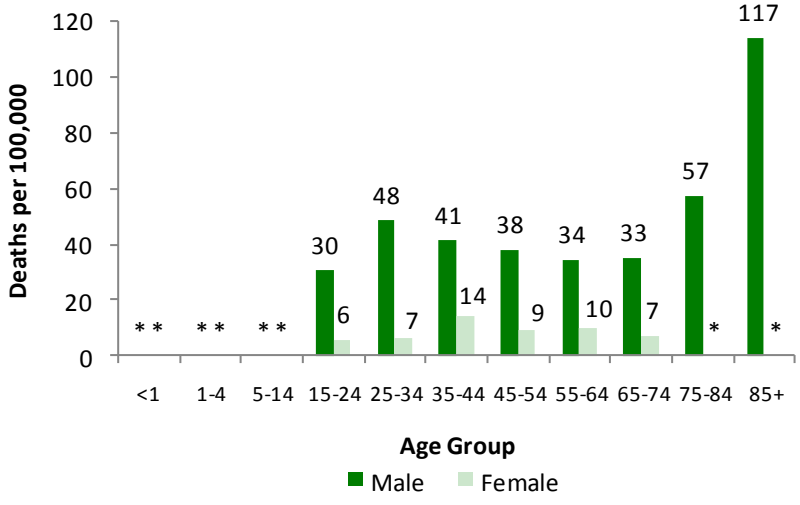


Figure 38. Death rates due to suicide by sex and age group, 2000-2008, Montana



* Too few deaths to calculate stable rate

- **The rate of suicide has only changed slightly since 2000 in the United States and Montana (Figure 37).**
- **Between 2000-2008, suicide rates were higher among males than females for all age categories (Figure 38).**
- **Men over the age of 75 have a higher rate of suicide than all other age groups (Figure 38).**
- **The most common manner of committing suicide in Montana is with a firearm (See figure 36).**
- **Nearly one in five high school students report that in the last 12 months they seriously considered attempting suicide (YRBS, 2009, Data not shown).**
- **About 8% of high school students report that in the last 12 months they attempted suicide (YRBS, 2009, Data not shown).**

Sexual Violence

Healthy People 2010 Target

- **Reduce the annual rate of rape or attempted rape to 0.8 rapes or attempted rapes per 1,000 persons aged 12 and older**
  - **MT: Rape only: 0.4 rapes per 1,000 persons (MT Dept of Justice, 2009)**
- **Reduce sexual assault other than rape to 0.4 sexual assaults other than rape per 1,000 persons aged 12 year and older**
  - **MT: Unable to calculate**

Overview:

Sexual violence refers to sexual activity where both partners do not consent. There are many types of sexual violence including harassment, threats, unwanted touching, and rape. Estimates of sexual violence are most likely low as many non-consensual sexual activities are never reported to the police.[12] Sexual violence can lead to physical injury including death and have long term mental impacts.[12] Promoting healthy relationships, helping people identify violent attitudes and behaviors, and creating anti-harassment policies at work and school help prevent sexual violence.

- **About 1 in 10 females in Montana report having been sexually assaulted or being a victim of attempted sexual assault (Table 12).**
- **The percent of reported completed or attempted sexual assault increases as income decreases (Table 12).**
- **Nearly 40% of sexual assault victims report the perpetrator as being their date, friend, or acquaintance (Figure 39).**

Figure 39. Perpetrator's relationship to the sexual assault victim, BRFSS, 2007, Montana

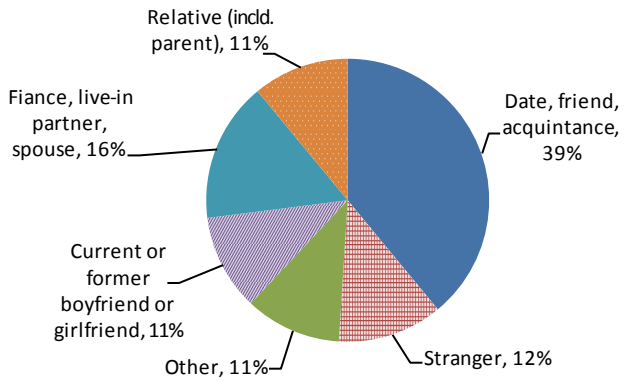


Table 12. Report of sexual assault experiences, BRFSS, 2007, Montana

	Ever victim of sexual assault	*Ever victim of attempted sexual assault*
	% (95% CI)	*% (95% CI)*
Sex		
Male	0.9 (0.5-1.6)	3.2 (2.3-4.3)
Female	9.6 (8.3-11.0)	11.2 (9.8-12.7)
Age Group		
18-24	4.3 (2.2-8.3)	8.0 (5.0-12.6)
25-34	5.5 (3.6-8.2)	8.3 (5.9-11.7)
35-44	7.8 (5.9-10.3)	8.2 (6.2-10.7)
45-54	6.6 (5.2-8.3)	8.7 (7.0-10.8)
55-64	4.7 (3.6-6.3)	5.9 (4.6-7.6)
65+	2.2 (1.5-3.1)	4.1 (3.0-5.6)
Race		
American Indian	5.6 (2.8-10.9)	11.6 (7.2-18.2)
Other	8.9 (4.9-15.7)	12.5 (7.3-20.7)
White	5.1 (4.4-5.9)	6.7 (5.9-7.7)
Income		
<$15,000	11.9 (8.6-16.3)	13.5 (9.8-18.3)
$15,000-$24,999	8.0 (5.8-10.9)	10.6 (8.0-14.0)
$25,000-$49,999	4.6 (3.4-6.1)	6.2 (4.8-8.0)
$50,000-$74,999	3.9 (2.8-5.5)	5.5 (4.1-7.4)
$75,000+	2.7 (1.8-4.3)	4.6 (3.3-6.4)
Total	**5.3 (4.6-6.1)**	**7.2 (6.4-8.2)**

Glossary/Acronyms

♦ Age Adjustment

Is used to compare two or more populations at one point in time. Age specific rates are applied to a standardized age distribution to eliminate differences in observed rates that result from age differences in population composition. Age adjustment is a relative index rather than an actual measure of risk.

♦ Behavioral Risk Factor Surveillance System (BRFSS)

See next page

♦ Cause of Death

The most important, immediate, direct or actual cause, or last event or act that occurred before the change of events leading to death

♦ Hospital Discharge Data (HDD)

See next page

♦ Intent

A course of action that one plans to follow. Classification for death intent are unintentional, suicide, homicide, and legal/war. Unintentional injuries are unplanned while intentional (suicide, homicide) are premeditated and planned.

♦ International Classification of Disease (ICD)

The international standard diagnostic classification for all general epidemiological, health management, and clinical uses. It is used to classify disease and other health problems recorded on many types of health and vital records. Data in this report used ICD-9 or ICD-10. ICD-9 codes are a 5 digit number while ICD-10 codes begin with a letter followed by 3-5 digits.

♦ Injury

Damage or harm done to or suffered by a person.

♦ Office of Vital Statistics (OVS)

See next page

♦ Rate

The fraction of people affected by a problem, event, or condition out of a population at risk. A rate is usually normalized to a denominator of 100,000 people for ease in comparison to other populations.

♦ Trauma Registry

See next page

♦ Years of Potential Life Lost (YPLL)

A measure of the relative impact of various disease and other lethal forces in a population. It is used to bring attention to the loss of expected years of life due to an early death (usually before age 65).

♦ Youth Risk Behavioral Survey (YRBS)

See next page

Methods

Methods

Data from the Montana Hospital Discharge Data System (HDDS), Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Survey (YRBS), Montana Trauma Registry, and the Office of Vital Statistics (OVS) at the Montana Department of Public Health and Human Services were used to compile this document.

Data on mortality are collected from death certificates reported to the Office of Vital Statistics. Data on deceased persons for whom an injury related ICD10 code was listed as the underlying cause of death on the death certificate during the years 2000-2008 were included in this analysis. The ICD10 codes can be found at http://www.who.int/classifications/icd/en. The National Center for Health Statistics' matrix was used to classify injury related ICD10 codes.

The HDD System provides access to inpatient hospitalization data provided by the Montana Hospital Association and is based on the 2004 Uniform Billing form. Data from hospitalizations occurring in 2006-2008 are presented in this document. Only persons hospitalized in Montana whose external cause was related to an injury were included. No race information was available from the HDDS. Reporting for the HDDS is not mandatory and discharges from Veterans Administration, Indian Health Service, and a few small private hospitals were not reported during this time period. These data cannot be deduplicated and therefore may include multiple instances of the same injury.

The BRFSS survey is a state-based random digit dial telephone survey of a sample of non-institutionalized adults conducted in all 50 states. This survey consists of questions about personal risks, behaviors, and lifestyle choices including several questions related to injury. There are limitations to this dataset including misinterpretation of questions or inability to recall an event. The survey does not capture persons in homes without a telephone. For more information see: http://www.cdc.gov/brfss/

The YRBS is administered every two years in a variety of high schools around the United States. Questions on the survey ask for information on health risk behaviors including tobacco, alcohol and drug use, dietary and physical activity, sexual activity, and injury and violence. The data are weighted to represent the state. The limitations of this dataset include misinterpretation of questions or inability to recall an event. For more information see: http://www.cdc.gov/yrbs/

The Montana State Trauma Registry provides injury related data from Emergency Medical Services information including 'on scene' data, injury related data, and demographics. Only persons whose injury fit certain criteria as being a trauma are included in this report. Injury type was classified by ICD-9 code. These data were not deduplicated and therefore can only represent number of reports.

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